Search Plan and Results

Question

What is the effect of dietary cholesterol intake on risk of cardiovascular disease, including effects on intermediate markers such as serum lipid and lipoprotein levels and inflammation? (DGAC 2010)

Date Searched

07/20/2009

Inclusion Criteria

Subjects/Population

Age: 2 years through adult

Setting: US and International

Health Status: Healthy and those with elevated chronic disease risk (CHD/CVD, Type 2 DM, Metabolic Syndrome, and Obesity.)

Nutrition Related Problem/Condition:

Search Criteria

Study design preferences: RCT or Clinical Controlled Studies, large nonrandomized observational studies, meta-analysis and systematic reviews. Feeding period must be greater than 4 weeks.

Size of study groups: The sample size must be ≥ 10 subjects for each study group. (For example, this would include 10 patients in the intervention group and 10 patients in the control or comparison group).

Study drop out rate: Less than 20%; preference for smaller dropout rates

Year Range: 2004 - Present

Authorship: (i.e., If an author is included on more than one Review Article or primary research article that is similar in content, the most recent review or article will be accepted and earlier versions will be rejected.)

Languages: Limited to articles in English

Other: Article must be published in peer-reviewed journal

Exclusion Criteria

Subjects/Population

Age: Infants/children less than 2 yrs

Setting: Inpatients

Health Status: None

Nutrition Related Problem/Condition: (i.e., eating disorders)

Search Criteria

Size of study groups: Sample sizes < 10

Study Designs: Cross sectional; Feeding periods less than 4 weeks.

Study Drop out rate: If the dropout rate in a study is 20% or greater

Year Range: Prior to Janauary 2004

Authorship: Studies by same author with similar in content.

Languages: Articles not in English

Other: Animal studies; Abstracts or presentations

Search Terms: Search Vocabulary

Electronic Databases

First search: "Cholesterol, Dietary" [MeSH Major Topic]

Total: 40 hits; 11 selected

PubMed search 7/20/2009

Second search: "Cholesterol, Dietary" [MeSH] AND "Lipoproteins, LDL" [MeSH] AND "Cholesterol, LDL" [MeSH]

Total: 20 hits; no additional selected articles that did not overlap w/ First search

PubMed search 7/20/2009

Total hits from all electronic database searches:

Total articles identified to review from electronic databases:

Articles Identified Via Handsearch or Other Means

Summary of Articles Identified to Review

Number of Primary Articles Identified:

Number of Review Articles Identified:

Total Number of Articles Identified:

Number of Articles Reviewed but Excluded:

List of Articles Included for Evidence Analysis

List of Excluded Articles with Reason

Article	Reason for Exclusion

REVIEWS FOR BACKGROUND/CONTEXT:

Kratz M. Dietary cholesterol, atherosclerosis and coronary heart disease.

Handb Exp Pharmacol. 2005;(170):195-213.

PMID: 16596800 [PubMed - indexed for MEDLINE]

This is a narrative review. However, in summary, the author makes an important distinction between dietary cholesterol alone and the "eating pattern" associated with high cholesterol intake. In particular, high cholesterol intake is associated with high total and saturated fat, and decreased PUFA and fiber consumption. When cholesterol intake is studied in isolation of these other negative dietary components, as can be done when testing egg consumption, research shows that dietary cholesterol alone has a minimal effect of CDH risk, although lowering dietary cholesterol may reduce CHD risk in genetically susceptible individuals.

Fernandez ML. Dietary cholesterol provided by eggs and plasma lipoproteins in healthy populations. Curr Opin Clin Nutr Metab Care. 2006 Jan;9(1):8-12.

PMID: 16340654 [PubMed - indexed for MEDLINE]

This is a narrative review that summarizes data based primarily on identified difference between subjects categorized as "hyperresponders" and "hyporesponders" to dietary cholesterol. According to the author, hyporesponders, i.e. individuals who do not exhibit increased serum LDL cholesterol after dietary cholesterol consumption, make up 70% of the US population. The summarized evidence shows that hyperresponders to egg consumption exhibited both increased LDL and HDL cholesterol in response to dietary cholesterol challenge. Furthermore, in both groups, egg consumption increased LDL particle size (less atherogenic) and shifted the LDL pattern from "B" to "A."

Staprans I, Pan XM, Rapp JH, Feingold KR. The role of dietary oxidized cholesterol and oxidized fatty acids in the development of atherosclerosis. Mol Nutr Food Res. 2005 Nov;49(11):1075-82.

PMID: 16270280 [PubMed - indexed for MEDLINE]

Food processing induces lipid oxidation in dairy products, eggs, meat and fish. In this narrative review, the authors summarize reports on dietary oxidized cholesterol, increased chylomicron and chylomicron remnant oxidized cholesterol and increased LDL and HDL oxidized cholesterol in the circulation. The authors hypothesize that dietary oxidized cholesterol contributes to increased circulating lipoprotein oxidized cholesterol which may, in turn, contribute to increase risk of atherosclerosis.

Kritchevsky SB. A review of scientific research and recommendations regarding eggs.

J Am Coll Nutr. 2004 Dec;23(6 Suppl):596S-600S. Review

PMID: 15640512 [PubMed - indexed for MEDLINE]

This is a narrative, historical review that sites numerous population-based studies that do not show a correlation between dietary cholesterol (in eggs) and serum LDL cholesterol. For example, the NHANES III study, a cross-sectional, population-based study that concluded that: 1) egg consumption was not associated with increased serum cholesterol and 2) egg consumption made and important nutritional contributions to the American diet in terms of micronutrients such as minerals, B vitamins, folate, etc.